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October 13, 1949

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TO: Technical Council Members

FROM: Edward Teller

SUBJECT: THE SUPER BOMB AND THE LABORATORY PROGRAM

ADWD-2-7 (DEL)

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On Monday there will be a disoussion in the Tech Council concerning the Laboratory program and in particular concerning the question whether our effort can be so increased as to make the Super Bomb feasible within the foreseeable future. I should like to present to you my views on this matter in this memorandum. In this way, I hope that more thought can be given to the question before Technical Council convenes.

I would like to outline why it is essential for us to develop a Super Bomb at the earliest possible time or else be able to say with reasonable confidence that the Super is not feasible. The arguments that have led me to this conclusion are of various kinds.

POLITICAL CONSIDERATION:

It is my conviction that a peaceful settlement with the Russians is possibl only if we possess overwhelming superiority. We do not now possess such superiority. The most promising prospect to acquire a great lead is by an early development of a Super Bomb. I am sure that such an accomplishment will in itself not solve the problem. Most difficult political questions will also have to be solved. But early possession of the Super Bomb will give us another chance in the political field. Without a Super Bomb such another chance is not likely to arise.

RUSSIAN PROGRESS:

The fact that an atomic explosion took place in Russia at this early a date has considerable significance. It seems that the Russian rate of progress is at least comparable to, if it does not exceed, the rate of progress in this country. The Russians have started working on the atomic bomb approximately in the summer of 1945. They are likely to have given consideration to the problem somewhat earlier but it is hardly probable that the total time of reasonably intensive effort in Russia has exceeded five years. This time is approximately the same as the time that was needed in this country to make and to explode an atomic bomb. Thus the rate of progress in Russia is comparable to the rate at which we have been working during the war. Our present rate of progress in comparison is far slower than in wartime.

It is probable that the Russians did not explore as many possibilities before achieving an atomic explosion as we did. It is also probable that the Russians have not put into their atomic development the same thorough and elaborate scientific and technical effort as we did. We can therefore claim that their accomplishment is not equal to our wartime accomplishment. If this is so, however, it merely proves that the elaborate precautions which we took in our atomic development was not absolutely essential. If the

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Russians continue to make actual progress faster and if we lose the atomic armament race, it will make little difference whether the reason has been the particular brilliance of Russian scientists or the exaggerated caution and thoroughness of our own group.

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A detailed possible picture of the Russian progress can be imagined along the following lines:

The Russians probably were familiar with the plans for the Canadian heavy water pile. The captured German scientists also knew of plans for heavy water piles. There are two major technical difficulties in the construction of such a pile. One is the fabrication of metallic uranium. This the Russians have probably learned from the Germans. The other is the production of great quantities of heavy water. There are several ways to accomplish this. One of the best techniques is the distillation of liquid hydrogen. The necessary low temperature technique is quite well developed in Russia. The Russians may therefore have had a pile of the approximate efficiency of the Chalk River pile as early as 1948 or even 1947. The extraction of plutonium from such a pile is a difficult job but can be more easily accomplished if the precautions taken for protection of personnel are less elaborate than those taken in this country. Such precautions are and must be a paramount consideration in our country but the same is not the case in Russia.

It is quite possible that the Russians have made a successful implosion. It is also possible, although perhaps somewhat less likely, that they have used the gun assembly and that the actual nuclear explosion was performed with a relatively inefficient gun gadget.

The above description gives the Russians credit for a minimum of scientific and technical progress. Even if this minimum is accepted, further Russian progress can be anticipated along the following lines. The Russians probably will build further heavy water piles. They may also build small piles working with some of the plutonium which the heavy water piles produce. These aims can be rapidly accomplished if no excessive demands are made with respect to high flux, resistance of materials for irradiation or with respect to breeding properties. The Russian rate of production of plutonium may equal the rate of our production within a year and indeed we have no absolute assurance that our production has not been already surpassed. It is therefore not impossible that the Russians should overtake us even in the matter of the stockpile which is the one item which never has been neglected in the United States.

An even more dangerous situation seems to exist with respect to neutron excess. This neutron excess is much greater for heavy water piles than it is for graphite piles and of course even greater for plutonium piles. Thus it is reasonable to assume that the Russians either are already ahead of us in this respect or will be ahead of us in the near future.

The number of available excess neutrons is of decisive importance in several war time applications of atomic energy. Among these the production of tritium is probably the most important since tritium production is an important component in the production of the Super Bomb.

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Therefore, it is quite possible that the Russians will possess a Super Bomb within a short time. The reasons for this conclusion can be summarized as follows:

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1. The Russians have been evidently working with considerable speed and efficiency and their efforts are not likely to slacken now.

2. The Russians are likely to have produced their plutonium in heavy water piles. Thus, they may even at present have considerably more excess neutrons available than we do. Their tritium production may thus surpass ours in the very near future.

3. The Russians had greater assurance than we did during the war concerning the feasibility of the fission bomb. It is therefore not impossible that even during their work on the fission bomb, they may have made thorough preparation for the time after the fission bomb has exploded. This preparation might have included work on the Super.

4. Our discussions have so far concentrated on designs of the Super whose feasibility can be proved theoretically. This has led to complicated--perhaps unnecessarily complicated--arrangements. Simpler ways of detonating a Super may exist and may be discovered by the Russians.

If the Russians demonstrate a Super before we possess one, our situation will be hopeless. In case of war, we can hardly hope to survive and it might even be possible that under such conditions, the Russians may force this country to surrender.

TRITIUM PRODUCTION IN AMERICA:

[redacted]

1. The techniques of tritium production have been improved by the use of lithium aluminum alloy.

2. Information from Chalk River indicates the immediate feasibility of heavy water production piles.

3. According to recent information received, the production of 1/10 ton to one ton heavy water per day would not be an expensive undertaking. In particular, it seems that a distillation pr[illegible] could be set up at a capital cost of about $7,000,000 [illegible] duction cost of about $9,000 per ton of D20 for [illegible] of producing one ton of heavy water a day. T[illegible] supply that heavy water production is not likely [illegible] become the bottleneck in the construction of heavy water piles.

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4. Early increase of tritium production could be had by collaboration with the Canadians and use of their Chalk River pile. An estimate shows that this pile could deliver 25 grams of tritium per year.

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5. The tritium production of the Hanford piles could be stepped up immediately by use of enriched slugs.

6. Somewhat later, the construction of highly enriched piles will raise the tritium production.

Thus, tritium could be produced in three steps: Immediately, in the Hanford piles by enriched slugs and in the Chalk River piles, in the near future with the help of more heavy water piles and somewhat later by strongly enriched piles.

LABORATORY PROGRAM:

Considering the arguments given above, it seems quite possible that the bottleneck in making a Super Bomb will be lack of theoretical knowledge and lack of technical knowhow in the Los Alamos Laboratory. As indicated the problem of tritium production is not likely to be the bottleneck and we must thus avoid the possibility that this Laboratory slows down progress. I should therefore urge that we give to these two problems top priority. I should like to recommend the following three immediate steps:

1. Lay plans for an early speed up and reorientation of Laboratory effort.

2. Obtain personnel capable of accomplishing the necessary job in the shortest possible time. I believe that the Laboratory should make an all out effort to try to obtain on a full time basis the help of the people most useful to help the Laboratory in the development of the Super Bomb, such as Enrico Fermi and Hans Bethe.

3. Call a conference in November for the discussion of the detailed steps which have to be undertaken inside and outside of the Laboratory in order to produce and test a Super in the shortest possible time. This conference would try to unite at one place much of the theoretical and experimental top talent from outside the Laboratory who can help and advise on details.

In more detail, I envisage the impact upon the Laboratory somewhat as follows: The Super program would become the No. 1 objective of the Laboratory. However, this would not mean that work on other important phases such as a small weapon, a penetrating weapon, et cetera, would be stopped. Only in cases of an irresolvable conflict between two programs would the Super program take precedence. In the early stages probably the largest burden of work on the Super program would fall on the Theoretical Division. After that various concrete problems would have to be explored.

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TIME SCHEDULE:

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If the Laboratory can marshall the necessary support from Washington for a really vigorous program, the problem of construction and detonating of a Super might be attacked with the same speed with which similar problems were attacked during the war. I realize that this program calls for an all out effort. However, I do not believe that anything less than such an all out effort would be commensurate with the responsibility which this Laboratory has undertaken with respect to the ultimate safety of the nation. It will be essential that all members of the Laboratory contribute fully any ideas they may have how to accomplish the technical details of this job.

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Authority of the District Engineer

By [signature] Colter

Date 6 Nov 1945

XXVIII-37

October 31, 1945

RESTRICTED DATA
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Dr. E. Fermi
Box 1663
Santa Fe, New Mexico

Dear Dr. Fermi:

This letter is to recommend continuation and intensification of work on the explosive energy release by thermonuclear reactions. These reactions liberate nuclear energies by "burning" of deuterium. The device is usually referred to as the "super bomb."

In our discussions on the subject it has become clear that we evaluate differently the present status of the super bomb, both from the technical point of view and from that of policies. At your request I summarize my ideas in this letter.

The great potentialities of releasing explosive energy from the comparatively inexpensive deuterium have been recognized. According to the consensus of opinion of informed scientists, there are good chances for the production of a super bomb.

A number of questions will naturally arise in connection with this project:

(1) How great an effort is needed to produce a super bomb?

The scientific effort is probably comparable to the work which has been done at Los Alamos on the atomic bomb. In addition a number of production jobs are required. Some of these will be undertaken anyway in connection with future development of the atomic bomb. Others, notably the production of tritium, can be accomplished by small changes in plants which are already projected. The total production effort needed is small compared to that which has so far gone into the atomic-bomb project.

(2) When could the first super bomb be tried out?

It is my belief that five years is a conservative estimate of this time. This assumes that the development will be pursued with some vigor. The job, however, may be much easier than expected and may take no more than two years. In considering future dangers it is important not to disregard this eventuality.

(3) How soon could another power produce a super bomb?

Most of the development and production work on the super bomb can proceed simultaneously with development and production of the atomic bomb. The time needed by another country to produce a super bomb may not be much longer than the time needed by them to produce an atomic bomb.

(4) How effective is a super bomb compared to an atomic bomb?

If the super bomb will work at all, it will be easy to produce an

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explosion equivalent to ten million tons of TNT. The destructive effects of such an explosion are roughly a hundred time greater than that of the bomb dropped on Hiroshima. A further great increase in energy release can be obtained at little additional cost. But a further increase in energy will not lead to a great increase of destructive effects unless the bomb is used to produce an earthshock, or is exploded above the atmosphere so that the heat effects of its visible radiation are exploited. The damage that can be inflicted in either of these ways by one bomb may greatly exceed the effect of a thousand atomic bombs.

(5) Can we rely for our leading position on mass production of present atomic bombs?

At the appearance of any new weapon the great progress achieved may seem to make further development unnecessary. This has always turned out to be wrong. Defensive measures (such as dispersal of cities) may prove quite effective against atomic bombs and very much less so against super bombs. It seems likely that the same destructive effect can be produced with one hundredth the effort if super bombs rather than atomic bombs are used. This must be borne in mind if the horrible possibility of a next war is to be faced in a realistic way.

(6) Are there any peace-time uses of the super bomb in sight?

The super bomb will make it possible in the near future to release energies comparable to those encountered in hurricanes or earthquakes. No detailed plans have been made how to put these explosive energies to beneficial use. But I consider it a certainty that the super bomb will allow us to extend our power over natural phenomena far beyond anything we can at present imagine.

(7) Is there any chance that the super bomb will ignite the atmosphere or will cause some other cosmic catastrophe?

Careful considerations and calculations have shown that there is not the remotest possibility of such an event. The concentration of energy encountered in the super bomb is not greater than that of the atomic bomb. In my opinion the risks were greater when the first atomic bomb was tested, because our conclusions were based at that time on longer extrapolations from known facts. The danger of the super bomb does not lie in physical nature but in human behavior.

(8) Are there moral objections against work on such a devastating weapon?

There is among my scientific colleagues some hesitancy as to the advisability of this development on the grounds that it might make the international problems even more difficult than they are now. My opinion is that this is a fallacy. If the development is possible, it is out of our powers to prevent it. All that we can do is to retard its completion by some years. I believe, on the other hand, that any form of international control

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may be put on a more stable basis by the knowledge of the full extent of the problem that must be solved and of the dangers of a ruthless international competition. The terrible consequences of a super bomb will not be avoided by ignoring or postponing the issue but by wise and provident planning.

I am in the process of finishing my work at Los Alamos. Much of this work was devoted to theoretical investigation of the super bomb. I feel that it is my duty to call attention at the present time to the necessity of transferring responsibility for this work to a capable and strong group of men. I realize that more work is required to dispel whatever doubts remain on the feasibility of the super bomb. But final doubt will not disappear until the day of the test, and in my opinion the chance of success is good enough at the present time to justify a large-scale program.

Sincerely yours,

Edward Teller

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TO: **Dr. E. O. Lawrence** DATE **November 9, 1945**

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I have personally received from (sender) **E.Fermi, Box 1663, Santa Fe, N.M.**

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E. O. Lawrence (Signature)

Nov 23, 1945 (Date)

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Project Whitney

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16 June 1952

To General Kenneth Fields Info Copy Carroll Tyler from Ralph Carlisle Smith. In view of the establishment of a new weapons research project which is to operate at Livermore, California, it is essential that we receive instructions immediately from the Director of DMA through appropriate channels relative to the transfer of weapon data information to members of that project. Among some of the problems which will face the Director's office of the Los Alamos Scientific Laboratory are the following:

1. Shall we grant blanket access to our classified report library to individuals on the Livermore Project? If so, to which ones? As you know, only a limited number of individuals have a complete blanket access within the Los Alamos Scientific Laboratory.

Ans. Yes, grant blanket access or limited access to specified individuals as designated by Fidler, Manager, Berkeley Area Office.

2. Who shall determine the scope of access to our classified report library on Livermore personnel?

Ans. As a temporary measure the Berkeley Area Office will act as a document control office for Livermore until Project Whitney has established an office in accordance with GM 172. This arrangement was agreed to on June 20 by telephone between Colonel Butman, DMA, and Shute, Asst Area Manager, Berkeley Area Office.

3. Are there any limits on the information which may be sent to the Livermore Project? Presumably production and stockpile data are not to be sent.

Ans. Blanket access does not, repeat not, include access to production or stockpile information. Otherwise no limits pertain to Livermore except as UCRL may wish to impose upon themselves.

4. To whom shall classified reports be sent? Naturally we want to send them to a document control station so that we may be relieved of accountability. If we send them to Wakerling we must then list the individuals who are authorized to have access to the weapon data as per GM-172. Furthermore it is probably undesirable to send the reports to Wakerling inasmuch as within a short time a new document control station will probably be formed at Livermore.

Ans. Send classified report to Fidler, Berkeley Area Office, until Livermore has established a document control office with appropriate facilities. For purposes of expediency, Berkeley Area Office shall be considered an excepted "organization" as regards internal handling of reports outlined in paragraph three of GM-172.

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5. Are all clearances of personnel from Radiation Laboratory satisfactory? You will recall that at one time there were personnel at Radiation Laboratory with Q clearances which did not authorize access to weapon data. Conspicuous examples can be given readily.

Ans. The accession list of Livermore personnel to LASL weapon data will be submitted to DMA and based on the best judgment of the Director, UCRL, and the Berkeley Area Manager. In addition AEC security will run customary security check of all names when provided.

6. Shall we establish continuing clearances to Los Alamos and in what alpha category? Presumably alpha eleven.

Ans. It is desired that continuing clearances to Los Alamos be established through agreement of Laboratory Directors.

7. What patent group will handle invention reporting for the AEC? While the Berkeley group is the closest there is the problem of access to weapon information. In the past the Laboratory has not given weapon information to field patent groups outside the Santa Fe Operations Office although it had been repeatedly requested to do so. Inasmuch as the patent advisory panel has recommended against the filing of patent applications in the field of weapon gadgets, it might not be necessary for another field patent group to process weapon inventions, particularly since Livermore reports will be available to the General Patent Group Washington for recording of novel ideas.

Ans. Livermore group is instructed to handle all weapon invention reports with Los Alamos Patent Group for maximum simplicity and control coordination. The Los Alamos Patent Group will doubtless be adequate for this purpose for some time hence. DMA endorses action already taken per your June 23 teletype in granting access to Project Whitney personnel to weapon data. We encourage to the maximum that matters be handled through coordination at Laboratory level insofar as possible.

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TO GENERAL KENNETH FIELDS INFO COPY CARROLL TYLER FROM RALPH CARLISLE SMITH PD IN VIEW OF THE ESTABLISHMENT OF A NEW WEAPONS RESEARCH PROJECT WHICH IS TO OPERATE AT LIVERMORE CALIFORNIA IT IS ESSENTIAL THAT WE RECEIVE INSTRUCTIONS IMMEDIATELY FROM THE DIRECTOR OF DMA THROUGH APPROPRIATE CHANNELS RELATIVE TO THE TRANSFER OF WEAPON DATA INFORMATION TO MEMBERS OF THAT PROJECT PD AMONG SOME OF THE PROBLEMS WHICH WILL FACE THE DIRECTORS OFFICE OF THE LOS ALAMOS SCIENTIFIC LABORATORY ARE THE FOLLOWING CLN ONE CMA SHALL WE GRANT BLANKET ACCESS TO OUR CLASSIFIED REPORT LIBRARY TO INDIVIDUALS ON THE LIVERMORE PROJECT QUREY IF SO CMA TO WHICH ONES QUERY AS YOU KNOW CMA ONLY A LIMITED NUMBER OF INDIVIDUALS HAVE A COMPLETE BLANKET ACCESS WITHIN THE LOS ALAMOS SCIENTIFIC LABORATORY PD TWO CMA WHO SHALL DETERMINE THE SCOPE OF ACCESS TO OUR CLASSIFIED REPORT LIBRARY ON LIVERMORE PERSONNEL QUERY THREE CMA ARE THERE ANY LIMITS ON THE INFORMATION WHICH MAY BE SENT TO THE LIVERMORE PROJECT QUERY PRESUMABLY PRODUCTION AND STOCKPILE DATA ARE NOT TO BE SENT PD FOUR CMA TO WHON SHALL CLASSIFIED REPORTS BE SENT PD NATURALLY WE WANT TO SEND THEM TO A DOCUMENT CONTROL STATION SO THAT WE MAY BE RELIEVED OF ACCOUNTABILITY PD IF WE SEND THEM TO WAKERLING WE MUST THEN LIST THE INDIVIDUALS WHO ARE AUTHORIZED TO HAVE ACCESS TO THE WEAPON DATA AS PER GM DASH ONE SEVEN TWO PD FURTHERMORE IT IS PROBABLY UNDESIRABLE TO SEND THE REPORTS TO WAKERLING INASMUCH AS WITHIN A SHORT TIME A

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UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

November 16, 1966

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National Laboratory Archives

Mrs. Pat McAndrew
Mail and Records
Los Alamos Scientific Laboratory
P. O. Box 1663
Los Alamos, New Mexico 87544

Dear Mrs. McAndrew:

During our visit to Los Alamos sometime ago, we found in your files a document which we thought would be available here at Washington Headquarters. A search of our records does not show that we have a copy, and I would appreciate it very much if you would make a copy from the one in your records.

The document is J. H. Manley to Members of the Technical Council, October 13, 1949. It is in your file marked 471.6 Super.

Thank you very much for your help.

Sincerely yours,

Richard G. Hewlett
Chief Historian

Declassified and released by the National Archives and Records Administration 1994-1995

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UNIVERSITY OF CALIFORNIA
LOS ALAMOS SCIENTIFIC LABORATORY
(CONTRACT W-7405-ENG-36)
P.O. Box 1663
LOS ALAMOS, NEW MEXICO

IN REPLY
REFER TO: MR

December 5, 1966

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National Laboratory Archives

Richard G. Hewlett
Chief Historian
U. S. Atomic Energy Commission
Washington, D.C. 20545

Dear Mr. Hewlett:

In reply to your letter of November 16, 1966, enclosed is a copy of the memorandum from J. H. Manley to Members of the Technical Council dated October 13, 1949.

I apologize for the delay in responding to your request. I have been out of the office for several weeks and just today returned to work.

Sincerely yours,

orig signed by

Pat McAndrew
Group Leader
Mail and Records

PM:dah

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(Notes prepared by Darol Froman on March 28, 1951 as a basis for discussion with Edward Teller on the Los Alamos Scientific Laboratory organization in connection with the thermonuclear program.)

Examples of the rules or agreements under which Darol Froman thinks he can operate and, perhaps, put Edward Teller in a position he will consider effective.

1. E. T. shall have a staff directly responsible to him. The number, including the number of new people expected within six months, should be estimated in order to provide suitable space, etc. D.F.'s guess is a number less than 25?

2. There shall be no restrictions upon the topics, devices or phenomena subject to theoretical study, conjecture or conception by this group.

3. Experimental and theoretical or computational work in other divisions of Los Alamos Scientific Laboratory may be induced by this group either informally by contact and agreement of individuals or formally through D.F.

4. There will be no experimental groups in this staff except in any case in which E.T. and D.F. agree in the need for an experimental group to undertake a type of work for which none of the existing experimental groups are suited. Individuals of this staff may, of course, do experimental work in present facilities by arrangement with experimental divisions as in No. 3 above.

5. The sum of the salaries paid to SM's and RA's shall not exceed the sum of their line values by more than 5% for this staff, and follow normal approval channels. E.T. himself is, of course, not included in this calculation. The classification and wage rate of all classified employees will be set by the wage administration section of the Personnel Department as it is throughout the rest of the Laboratory. Wage administration will need the aid of E.T. or his designee in evaluating the jobs.

6. D.F. will be responsible for getting fabricated, etc., any objects he and E.T. agree upon for nuclear detonation test, prototypes or models for local experimentation leading to such objects, and for getting accomplished the relevant local experimentation. This will be done in the normal way by experimental divisions doing the work, issuing purchase requests for materials and parts, issuing work orders on shops and each other, etc.

7. Contracts or arrangements with persons or organizations outside LASL to do work relevant to the thermonuclear activities will be undertaken at the discretion of D.F. acting with the aid of advice from whomever he chooses but generally including advice from E.T. or a member of his staff. D.F. will encourage external arrangements bearing directly upon the important objectives of the thermonuclear program as seen at the time such arrangements are made.

8. E.T. will, in the near future, assist D.F. in formulating and ordering in priority and importance, the main, specific objectives (long and short range) of the current thermonuclear program. These will require revision from time to time. D.F. will also ask the assistance, in formulating these objectives, of several other persons among whom there are those whose opinions E.T. considers to be biased or valueless on this topic. Except within E.T.'s staff, D.F. will attempt to guide the work throughout LASL,

CLASSIFICATION CANCELLED
BY AUTHORITY OF DOE/OC
CLASSIFIED BY
DATE

and with outside contractors, in conformity with the priorities and importance established for these objectives. He will also, where necessary, compare the importance and urgency of such thermonuclear jobs with fission weapon development jobs and, in cases of conflict, attempt to adjust the work accordingly. (To give a feeling as to how D.F. may react, he has an a priori belief that it will be found appropriate to devote about half of T-Division effort to thermonuclear work for the next several months, and a very much smaller fractional effort in many of the other divisions, but this is certainly not a firm opinion.)

A serious question arises here as to whether or not this proposed plan will work if it should happen that E.T. is in serious disagreement with the program. For example, suppose that, after collecting advice, it appears to D.F. the priority or importance of work leading toward tests of thermonuclear devices is so low compared with the importance of other thermonuclear objectives and fission weapon objectives that no work by T-Division or the experimental divisions would be done on such test devices for several months or a year. D.F. has no conviction that this conclusion will be reached, but if it should be, can E.T. and his staff continue to work effectively? Would E.T. agree to continue to work on thermonuclear problems at Los Alamos under these conditions in which disagreements of the nature of, but possibly of lesser importance than the above example are likely to arise from time to time?

9. E.T. and his staff will, of course, be equivalent to a division leader and division in such matters as overtime work, engaging consultant services, dealing with the Personnel Office on new hires, salary increases in the staff, etc., budgeting and the like. For accounting and budgeting purposes a personnel ceiling will be established but, if history is repeated, this will probably be adjusted from time to time.

10. D.F. regretfully believes that there exists a situation in this country, and a system of operation within the AEC, such that it will be necessary for him to give some consideration, in setting priorities on objectives, to statements in the current LASL program, past pronouncements by the Laboratory and similar items, even in some cases in which present technical information may be at variance with these things. However, he feels strongly that no such "political" pressures should influence the program to proceed in a technically demonstrable poorer way than an alternative. If changes are made in our basic concepts as to what we are trying to do in thermonucleonics, it is likely that these changes will have to be explained and "justified" in some detail.

DOE ARCHIVES

11. As a result of formulating certain of the major objectives of our program, a conception, however inaccurate, of the main features of the end product will result. Thus, there are now various conceptions of supers and alarm clocks and their characteristics. D.F. will attempt to set up continuing means to study (not experimentally) the military worth, including economic factors, delivery methods, etc. for these objects as conceived. Estimates of the military worth will, of course, affect the priorities of the objectives.

[redacted]

12. If desired, probably the Director would write a letter to E.T., copies as E.T. desires, setting out or delimiting E.T.'s responsibilities in accomplishing the thermonuclear program.

13. D.F. believes that it will often be found impossible or impractical to meet development time scales which E.T. will picture as desirable and practicable. D.F. can only undertake to do his best to speed projects undertaken in this program but it should be recognized that differences of opinion in this matter are likely to arise.

If some set of understandings similar to the above is not agreed upon it would seem foolish for D.F.to undertake a job of special responsibility in this field as indicated by the Director (N. E. Bradbury). If agreement cannot be reached, then D.F. takes the attitude that the matter can be resolved only between E.T. and N.E.B. by either E.T. withdrawing from his position on the contentious points or N.E.B. withdrawing from his position that D.F. shall be generally responsible for thermonuclear work at LASL. D.F. will not object to the latter action and, in general, the above points only serve to indicate the basis upon which he is willing to accept the responsibility.

DOE ARCHIVES

It should be clearly understood by E.T. and D.F. that, no matter what agreements such as those above we may reach, N.E.B. at any time may make decisions affecting or reversing any action we may have decided to take.

[redacted]

JASON 60-63

INSTITUTE FOR DEFENSE ANALYSES

1707 H Street, N.W., Washington 6, D.C.

IDA

JASON Summer Study Group
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

July 21, 1960

Dr. Edward Teller
Lawrence Radiation Laboratory
Building 50
University of California
Berkeley 4, California

Dear Dr. Teller:

What is perhaps the last formal meeting of the JASON Summer Study Group of 1960 is to be held on August 5, 1960. It deals with Christofilos' proposal for a long-range sonar and is to be attended by various people who have worked with long-range or with high powered acoustic systems or with the environment in which they must operate.

If you think you might be able to come, would you be good enough to let me know?

Sincerely yours,

David A. Katcher

David A. Katcher

DAK:nem

INSTITUTE FOR DEFENSE ANALYSES

Jason Summer Study Group
Lawrence Radiation Laboratory
Berkeley 4, California

S O N A R Meeting
August 5, 1960

9:30 AM	About 15 minutes each on what facts are known about:	
	Propagation in Deep Sound Channel	Hudson Labs.
	Noise as it affects long-range systems	Marine Physical Lab.
	Reverberation	Marine Physical Lab.
10:30	About 30 minutes each, talk and discussion, on the main features of and main problems with long-range or high-powered systems:	
	Artemis	Hudson Labs.
	Lorad	N.E.L.
	Colossus	USNUSL
12:30	Lunch, in	
1:30	Summary of Christofilos proposal	Christofilos
2:30	Relevant Experiments	N.E.L. Hudson Labs.
3:30	General Discussion	
	Summarization	

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N.W., Washington 6, D.C.

IDA

Jason Summer Study Group
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

June 21, 1960

Dr. Edward Teller
Radiation Laboratory
University of California
Berkeley 4, California

Dear Edward,

Enclosed material indicates the change in orientation of the scientific and technical group in IDA which has previously been assisting ARPA. We want to let members of Jason know about this change, partly because they may, from time to time, interact closely with the new Research and Engineering Study Group for the Department of Defense. We also hope that you will let us know of good candidates for the Group, since its effectiveness will depend strongly on the intelligence of those who participate in it.

Sincerely yours,

Charles

Charles H. Townes
Vice President and
Director of Research

Enclosure

C O P Y

C O P Y

DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
Washington 25, D. C.

May 13, 1960

Dear Mr. Norton,

In several informal discussions we have described to you the need for organizing scientific and technical advice to the Director of Defense Research and Engineering and his staff. In the enclosure, I am herewith transmitting to you a proposed plan for reorienting the existing IDA-ARPA arrangements by creating a Research and Engineering Support Group (RESG) of the Institute for Defense Analyses. This new group will replace the present ARPA Division and, for the present, should be approximately the same size as the ARPA Division.

It is my belief that this new group will be primarily concerned with giving advice, performing analyses, theoretical investigations, and technical planning pertaining to defense research and engineering; thus, it will be differentiated from the Weapons Systems Evaluation Group which has primary responsibility for making comparative evaluations of weapons systems and studying their effectiveness and operational possibilities.

If the enclosed plan for transforming the Advanced Research Projects Division into the new Research and Engineering Support Group meets with your approval, we should take steps to put it into effect.

Sincerely yours,

(signed by Herbert F. York)

HERBERT F. YORK

1 Encl.
Proposed plan.

Mr. Garrison Norton
President, Institute for Defense Analyses
1710 H Street, N. W.
Washington 6, D. C.

May 13, 1960

PROPOSED PLAN FOR ESTABLISHMENT OF RESEARCH AND ENGINEERING SUPPORT GROUP OF IDA

PURPOSE: To establish, by contract with IDA (a non-profit corporation) a means of providing support to the Office of the Director of Defense Research and Engineering by a group of outstanding scientists and engineers whose role will be advisory to the Director. Pursuant to the contract, problems will be assigned to this group by the Director or selected by the group itself as pertinent to the Director's task. Assignment of problems will be by mutual consent of IDA and DDR&E.

GUIDELINES: This organization should provide full-time personnel for a continuing effort in analysis, synthesis, scientific evaluation and technical planning. Part-time personnel may also be used.

Principal offices of the organization should be outside the Pentagon, but in the Washington area; however, a few members may be located in the DDR&E offices.

Selected, qualified military personnel may, when appropriate, be assigned to work with the Group.

All studies, evaluations, recommendations and reports emanating from this Group will be rendered to the DDR&E and shall be advisory only; no member of this Group will act as administrator or project manager with respect to any government action resulting from its recommendations.

NAME: It is suggested that this Group be called the Research and Engineering Support Group of the Institute for Defense Analyses (RESG-IDA).

TRANSITION FROM ARPA TO RESG: The Advanced Research Projects Division (ARPD) of IDA will be reoriented into RESG. A normal function of RESG will be continuation of technical and scientific support for ARPA. New assignments will include work for the DDR&E as described herein.

IDA FUNCTIONS: The basic function of RESG will be to furnish scientific and technical advice and assistance to the DDR&E. More specifically, it will include:

1. Analyzing research results and data, synthesizing scientific data from diverse sources, making technical evaluations and long-range technical plans, performing analysis of relevant areas of science and technology in order to recommend emphasis in research and development and performing technical evaluations and long-range studies in any area of DDR&E interest;

2. giving technical advice and performing analyses, as requested, on current DDR&E research problems and engineering programs;

3. furnishing suitable reports and records of this work.

SCOPE OF RESG EFFORT:

1. EVALUATION OF MAJOR R&D PROBLEM AREAS - This would include analysis of existing information, evaluation or technical scrutiny of major technical problem areas in Defense R&D, and guidance in delineating future direction of effort in such broad problem areas as communications interference from nuclear explosions, re-entry phenomena, kill mechanisms for use against ballistic missiles, etc.

3. RESEARCH PLANNING ASSISTANCE - This would include long-range studies and evaluations of current and future research in specific technical areas such as materials, electronics, chemistry, aeronautics, physics, fuels, computers, or energy sources. This effort would be closely coordinated with the Directors of the appropriate offices in DDR&E.

4. WEAPONS PLANNING - This would include long-range planning studies of the possible application of new scientific discoveries or new technical developments to such areas as strategic and tactical weapons, air defense, communications, undersea warfare, or special projects. This effort would be closely coordinated with the appropriate deputies or assistant directors of DDR&E.

SPECIAL PROVISIONS:

1. RESG will be expected to use a reasonable amount (approximately 15%) of its effort in the conduct of defense research studies of its own choice. The object of this provision is two-fold, to explore new areas of potential interest to DDR&E and to maintain and improve the capabilities of the Group.

2. Work assignments to RESG will be issued as task orders, to be mutually acceptable.

3. RESG will be provided such information as is necessary for accomplishment of its task.

INSTITUTE FOR DEFENSE ANALYSES
1707 H Street, N.W., Washington 6, D.C.

November 16, 1960

Dr. Edward Teller
Radiation Laboratory
University of California
Berkeley 4, California

Dear Edward:

I thought you might find interest in this brief summary of the activities of the Jason Group for its first nine months.

Sincerely yours,

Charlie

Charles H. Townes

CHT:mi
Enclosure

IDA Log 5-1931 destroyed 9/16/64

P.S. You did an excellent job on the TV discussion with Szilard.

C.H.T.

INSTITUTE FOR DEFENSE ANALYSES

1707 H Street, N.W., Washington 6, D.C.

12/23/60

Dear Dr Teller:

A paper by Nicholas Christofilos on an early warning radar has been sent to you at your classified facility.

Yours,

David A. Katcher

David A. Katcher

DAK:mi

INSTITUTE FOR DEFENSE ANALYSES

1707 H Street, N.W., Washington 6, D.C. IDA

February 3, 1961

Dear Professor Teller:

A paper by Val Fitch & Leon Lederman on VELA HOTEL: Comments on Simplified Logic has been sent to you at your classified facility.

Yours,

David A. Katcher

David A. Katcher

DAK:mi

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N.W., Washington 6, D.C. IDA *Dr. Charles H. Townes, Vice-President and Director of Research*

September 15, 1960

Dr. Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Edward,

I want to let you know that we in IDA, as well as members of the Jason Division, appreciate enormously your warm welcome and the cooperation of LRL during the summer study session. The stay there was a very pleasant and stimulating one for the Jason Group, and my readings say also that those who participated judge it to have been quite effective. Many thanks for your kind arrangements and encouragement, and for the helpful association with the Livermore Laboratory.

Before long we hope to send you an informal summary of the efforts of the Jason Group during its first nine months. Best regards.

Sincerely,

Charlie

INSTITUTE FOR DEFENSE ANALYSES

1707 H Street, N.W., Washington 6, D.C. IDA Garrison Norton, President

F. Harold Brown

December 20, 1960

8-401

MEMORANDUM FOR THE MEMBERS OF THE JASON DIVISION

Murph Goldberger asked me to poll you on your sentiments with respect to the next summer study in light of information gathered since the October meeting on the availability of office space and housing at Los Alamos.

The Laboratory recently informed us that it will be able to provide quarters with adequate working space for the entire Group in one location and not more than a large grasshopper's jump from the new Administration Building housing the T division. A possible drawback is that, though well lighted and ventilated, there are no windows.

The housing situation is very tight at the Laboratory as many of you know and almost one-third of the personnel there commute from as far as Santa Fe. No difficulty is anticipated in housing on the Hill those members who come without their families. The Laboratory may be able to find a few houses on the Hill for members with families but the bulk will have to be accommodated elsewhere with Santa Fe (about 35 miles, good roads) as the approximate limit.

The Steering Committee recalls that Los Alamos was considered by the Group to be their first choice for the summer study provided satisfactory housing could be obtained. The committee is uncertain at this point of what "satisfactory" means. Would you, therefore, please answer the enclosed questionnaire? It may be possible to interpret your answers unambiguously and thus assist both the committee's deliberations and its feeling of fealty to the democratic process.

We are of course going ahead with examining other locations, such as Bowdoin, Barnstable, Woods Hole, and there is always a possibility that Berkeley would have the Group back again.

David A. Katcher

David A. Katcher

Enclosure

P O L L

1. I intend to participate in the Summer Study:

   a. Only if 15 June to 30 July

   b. Only if 15 July to 30 August

   c. All of either

   d. Part of either

   e. Depending on where it will be held

   f. Maybe

   g. Not at all

2. I intend coming:

   a. With family: Self,_____adult(s), and _____child(ren)

   b. Without family

3. I will come to Los Alamos

   a. Only if I can live near the Lab. on the Hill

   b. Only if I can live no further than Nambe or Espanola (10-20 miles)

   c. I will be willing to live at a house up to 35 miles away

   d. The quarters I will need would be:

      (1) Standard development type house

      (2) Group housing

      (3) Other

4. Perturbations:

Name_____

INSTITUTE FOR DEFENSE ANALYSES
IDA

UNIVERSITY OF CALIFORNIA

LAWRENCE RADIATION LABORATORY
BERKELEY 4, CALIFORNIA

January 31, 1961

Mr. David A. Katcher
Institute for Defense Analyses
1710 H Street, N. W.
Washington 6, D. C.

Dear Mr. Katcher:

Many thanks for your letter of the 24th about the summer study scheduled in Maine from June 12 through July 28.

I am scheduled to spend about six weeks at the University of Hawaii during this period although my future program is somewhat uncertain at this time. I am presently hospitalized with an acute case of colitis and will have to work out a definite schedule a little later. I am very sorry that I will be unable to join the Study Group this summer, but hope that I will have another occasion to see you and other IDA people soon.

Sincerely yours,

Edward Teller

ET:gg

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N.W., Washington 6, D.C.

IDA

January 24, 1961

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Professor Teller:

The Jason Group will be holding its summer study at Bowdoin College in Brunswick, Maine, from June 12 through July 28. A greater number of members of the Group will be coming than was true last year. As before, people will be working in small groups on a variety of problems although some may be of general interest; there will be seminars and lectures as the need for them arises; and the papers which result will be only of that work which the authors find worth a record.

If you will be able to spend time with the Group this summer this news, as I am sure you know, would be welcomed. If you would be good enough to let me know, perhaps I can also be of some assistance in finding a place for you to stay.

Yours very truly,

David A. Katcher

David A. Katcher

DAK: mi

No Survey Health.

[illegible]

UNIVERSITY OF CALIFORNIA

LAWRENCE RADIATION LABORATORY
BERKELEY 4, CALIFORNIA

February 23, 1961

Mr. David A. Katcher
Institute for Defense Analyses
1710 H Street, N. W.
Washington 6, D. C.

Dear Mr. Katcher:

We have your letter of the 21st to Dr. Teller concerning his biographical material. The information you have from the American Men of Sciences is somewhat out of date. I think the best way of handling this is to send you an up-to-date biography of Dr. Teller, which is enclosed herewith.

Sincerely yours,

(Miss) Genevieve Greteman
Secretary to Edward Teller

Enc.

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N.W., Washington 6, D.C.

IDA

STerling 3-0240

February 21, 1961

Dr. Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Dr. Teller:

Official requests are occasionally made to the Institute for biographical information on members of the Jason Group. We are noting below your biographical information contained in the American Men of Sciences. If this information is not complete would you be good enough to supply us with the additional information?

Physicist; b. Budapest, Hungary, Jan. 15, 08; m. 34; c. 2. student Inst. of Tech., Karlsruhe, Germany, 1926-28; PhD., U. of Leipzig (Germany), 1930; D.Sc. (hon.), Yale, 1954, U. Alaska, 1959; Research assoc., Gottingen, Germany, 1931-33; Rockefeller fellow, Copenhagen, Denmark, 34; lecturer U. of London, 35; prof of physics George Washington U., Washington, 35-41; Inst. for Nuclear Studies, U. of Chicago, 45; prof. of physics, U. of Chgo., 46-49, 51-52; professor physics U. of California, 52--, asst. dir. Los Alamos Sci. Lab., New Mexico, 49-51; cons. U. of California Radiation Laboratory, 52, staff mem., 53, asso. dir., 54--, dir., 58--; concerned with planning and prediction function atomic bomb and hydrogen bomb, Manhattan Dist. of Columbia U., Metall. and Laboratory of Argonne Nat. Lab., U. of Chicago, and Los Alamos, New Mexico, 41-51, Radiation Lab., Livermore, Cal., 52--. Mem. sci. adv. bd. USAF; gen. adv. com. AEC. Recipient Joseph Priestley Meml. award Dickinson Coll., 57; Albert Einstein award, 58. Fellow Am. Nuclear Soc.; mem. Am. Acad. Arts and Scis., Am. Ordnance Assn., Nat. Acad. Sciences, Am. Phys. Soc. Author: (with Francis Owen Rice); The Structure of Matter, 48; (with A. L. Latter) Our Nuclear Future, 58. Home: 1573 Hawthorne Terrace, Berkeley, Cal. Office: Radiation Lab., U. of Cal., Livermore, Cal.

Yours very truly,

David A. Katcher

David A. Katcher

INSTITUTE FOR DEFENSE ANALYSES

IDA

March 3, 1961

Dr. Charles Townes
Institute for Defense Analyses
1710 H Street, N. W.
Washington 6, D. C.

Dear Charlie:

Thank you for sending me several papers from your project. I enjoy seeing them and I am greatly impressed by the progress you are making. I hope that I will continue to receive the reports.

As I have written to Mr. Katcher, I will not be able to meet with you in Maine this summer. This is partly due to an earlier commitment to teach summer school and partly due to strict doctor's orders to cut down on my activities. I hope that by next fall I will be allowed to work at full steam again and get together with you as soon as possible.

Please keep in mind the possibility of your whole group, smaller groups or individual members visiting the Radiation Laboratory again as soon as possible. It would be wonderful if you would decide on another visit in the summer of 1962. If there is any serious chance of this, please let me know so that I can make sure of proper arrangements.

Sincerely yours,

Edward Teller

ET:gg

INSTITUTE FOR DEFENSE ANALYSES

Research and Engineering Support Division IDA *1825 Connecticut Avenue, N.W., Washington 9, D.C.*

April 5, 1961

MEMORANDUM FOR THE JASON GROUP

SUBJECT: Outside Interests, II

You may recall my memorandum of 16 May 1960 on the question of outside interests and how to best protect the unusual and immensely broad need-to-know certification given members of the Jason Division by the Director of Defense Research and Engineering. No new problem has arisen, but perhaps it's time for an immunization booster in the form of this reminder. In order to avoid conflict of interest, or the appearance of such, members of the Jason Group are not normally expected to consult for commercial concerns in the defense areas. But occasions may arise where such relationship with a commercial firm is in the national interest or is appropriate for some special reason and this memorandum is written to make more explicit the means by which those members of the Group who do such consulting, and IDA as well, can be protected if questions of conflict of interest arise.

The most direct procedure is to make certain that IDA is aware of any pending arrangement and then, if it is effected, to see that IDA has for its records a statement of the problem involved, the work done, and the base (if any) on Jason information. It may be found desirable depending on the circumstances for the consulting performed to be considered part of Jason work and therefore supported by IDA. In any event, having obtained a record we can let the paper sit in the files as a shield against questions which might arise, even years from now.

It would be helpful in the same sense to have a note from you --if you have not already sent one--on the nature of any consulting arrangement which you now maintain which might conceivably appear to anyone to involve a conflict of interest.

A little care and forewarning on continuing relationships with any particular organization should allow members of the Jason Group to continue with much flexibility to work on those problems and with those associates which seem most useful.

Charles H. Townes

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D.C. IDA

June 2, 1961

TO ALL JASON MEMBERS:

If you want to have your mail sent to the office this summer, our address will be:

Institute for Defense Analyses
P. O. Box 613
Brunswick, Maine

David A. Katcher

David A. Katcher

DAK:mi

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D. C.

April 12, 1961

MEMO FOR MEMBERS OF THE JASON GROUP

Nick Christofilos asked that this second draft of his traffic radar paper (he has modified parameters, etc.) be forwarded to you in advance of the coming meeting where it will be discussed.

Here it is.

David A. Katcher

DAK/ln

Enclosure

S-1541|3

S-1540|3

returned to Tech Info 4/25/61

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D. C. IDA

February 2, 1961

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Professor Teller:

This is a copy of a Jason paper by Fitch and Lederman on VELA HOTEL: Comments on Simplified Logic.

Yours very truly,

David A. Katcher

David A. Katcher

DAK/lm

Enclosure

IDA Log No. C-1456/10
returned to Tech Info
4/25/61

INSTITUTE FOR DEFENSE ANALYSES

1707 H Street, N.W., Washington 6, D.C. IDA

December 19, 1960

This is the final draft of Nick Christofilos' paper. Copies have been forwarded to the Navy's TRIDENT Committee.

David A. Katcher

David A. Katcher

S-1334/61
returned to Tech Info
4/25/61

60-65

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D. C.

February 14, 1961

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Professor Teller:

Here, at long last, is the

Drell-Ruderman IR paper.

Yours very truly,

David A. Katcher

David A. Katcher

DAK:mi
Enclosure

IDA Log S-1338/5

sorry that you will not have time this summer. We will continue & send notices in case you should be free -

returned & Techdrfts 4/3-5/61

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D. C. IDA

March 29, 1961

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Professor Teller:

Another Jason paper off the press -- Infrared Radiation from the Atmosphere by Drell and Ruderman.

Yours very truly,

David A. Katcher

David A. Katcher

DAK:mi
Enclosure

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D. C. IDA

April 11, 1961

A second draft of Christofilos' traffic radar paper is in the mail and on its way to you.

It will probably be discussed Saturday morning, April 29.

David Katcher

David A. Katcher

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D. C.

IDA

December 11, 1961

TRAVEL INSURANCE FOR THE JASON GROUP

If you would be good enough to complete the attached form*, designating a beneficiary, you will be covered by an insurance policy in the amount of $50,000 for accidental death and dismemberment while traveling on IDA business.

You may regard this coverage as automatic if you leave word with somebody, or advise us, that you are traveling on IDA business when you take off on a trip for Jason.

With this insurance coverage, trip insurance should no longer be claimed on your travel reimbursement vouchers.

David A. Katcher

David A. Katcher

DAK:mi
Attachment

*and return it to us

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D. C.

IDA

February 21, 1962

JASON SUMMER HOUSING

I am forwarding a blank by which you may enlist the aid of the housing bureau at the Lawrence Radiation Laboratory, Berkeley, in finding a home for yourself and family during the 1962 Jason Summer Study. After you fill out the blank (by size of family is meant age and sex of each child, parent, or friend) please send it directly to Mrs. Sally Barieau, whose card is enclosed. It is best that you deal directly with her.

The dates agreed upon are July 15 through September 1 but please note that specific working space at the Laboratory has not yet been definitely found. I will let you know touch-down as soon as I get it.

Would you also let me know your plans (including if's and but's)? It will help us to have a tentative head count even though you will not be considered committed unless you say so.

David A. Katcher

David A. Katcher

DAK:mi
Enclosures (2)

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D.C. IDA Dr. Charles H. Townes, Vice-President and Director of Research

April 25, 1961

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Edward:

Through error, a letter circularizing the Jason Group with cautionary words on possible conflict of interest between Jason work and outside consulting was sent to you. This letter was intended only for the continuously active members of the Group and not the Advisors, whose guidance and help is occasional, more than ever welcome, and unlikely to become involved in such a way as to create such a problem.

Sincerely yours,

Charles

CHT:mi

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D.C. IDA

January 24, 1962

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Professor Teller:

We are forwarding to you through classified mail channels the formal version of the paper by Low and Treiman on re-entry effects.

Yours,

David A. Katcher

David A. Katcher

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D. C. IDA

March 20, 1962

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Professor Teller:

I am forwarding to you under separate cover Nick Christofilos' final printed version of his paper on "A Radar Interferometer" (S-2407). It is unchanged over the draft, which he did shortly after the Summer Study at Bowdoin closed down.

Yours very truly,

David A. Katcher

David A. Katcher

DAK:mi

RECEIVED
COMMUNICATIONS
OFFICE
MAR 27 9 43 AM '62

WUN004 /B WWY002 WWZ6 WWZ6 NL PD WASHINGTON DC 26 LRL BERKELEY

PROFESSOR EDWARD TELLER, LWXX LAWRENCE RADIATION LAB

UNIV OF CALIF BERKELEY CALIF

THERE WILL BE NO GENERAL JASON MEETING THIS SPRING DUE HEAVY SUBGROUP ACTIVITY AND EXPECTED FULL ATTENDANCE BERKELEY. AMRAC MEETING WEST COAST EARLY MAY MAY ATTRACT. INFORMATION COMING ALSO INFORM ME IF YOU WISH SETUP WITH ANYONE IN WASHINGTON CONTINUOUXXX CONTINUOUS APS MEETING WHICH ENJOY FULLEST. BESTEST

DAVID A KATCHER

CALLED Gen
EXT 5419 BLDG 50 ROOM 149
TIME 10:40
DATE MAR 27 1962
BY Mary EXT. 362

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N.W., Washington 6, D.C. IDA

May 3, 1962

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Professor Teller:

I am sending you through classified mail channels the formally published version of the HB-T paper by Goldberger, Lewis, and Watson, IDA Log No. 2373.

This brings up a point: you may be accumulating several drafts of the same document. If so, and you want to return duplications of this sort, please do.

Yours very truly,

David A. Katcher

David A. Katcher

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D. C. IDA

March 30, 1962

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Professor Teller:

While this meeting is of particular interest to people who are involved in re-entry problems, I thought you might like to see the program. If you want to attend, would you let me know and I will have it arranged? The meeting is to take place in San Diego.

Yours very truly,

David A. Katcher

DAK:mi
Enclosure: AMRAC Program
30 April - 2 May 1962

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D. C. IDA

April 19, 1962

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Professor Teller:

I am sending you through classified mail channels "HB-T Primer" by Goldberger, Lewis and Watson, IDA Log S-2608.

Yours very truly,

David A. Katcher

David A. Katcher

INSTITUTE FOR DEFENSE ANALYSES

International Studies Division IDA *1710 H Street, N.W., Washington 6, D.C.*

May 7, 1962

Dr. Edward Teller
University of California
Lawrence Radiation Laboratory
Berkeley 4, California

Dear Dr. Teller:

I am glad you found the papers by Tucker and Halperin interesting. They are both engaged in revising the papers for publication in a book later this year. Meanwhile, I am passing along to them your invitation to talk to you if they are ever in the Bay area.

Sincerely,

James E. King, Jr.
Director

cc: M. H. Halperin
R. W. Tucker

WUN007 PA778 W RBY002 RBZ 1 RBZ1 NL PD RB WASHINGTON DC OCT 23

PROF EDWARD TELLER LAWRENCE RADIATION LABRATORY

UNIVESXX UNIVERSITY OF CALIF BERKELEY CALIF

THE AUTOMNAL JASON MEETING WILL BE HEALD AT THE NW XXX NEW

IDA HEADQUARTERS BUILDGGXXX BUILDING 1666 CONNECTICUT AVENUE

NW ON FRIDAY THROUGH SUNDAY NOVEMBER 30 DECEMBER 1 AND 2

DAVID A KTAXXX KATCHER

IDA 1666 NW 30 1 2

416A

CALLED Barb

EXT 848 BLDG 517 ROOM 412

TIME 8:53

DATE OCT 24 1962

BY Mary EXT. 362

LRL BERKELEY
OCT 24 8 05 AM '62
RECEIVED
COMMUNICATIONS
OFFICE

Dear Professor Teller:

We are putting out a revised edition of Jason biographies to bring things up to date. Do you have anything to add?

Yours very truly,

David A. Katcher

David A. Katcher

DAK:jp

Enclosure

INSTITUTE FOR DEFENSE ANALYSES

1666 Connecticut Avenue, N.W., Washington 9, D.C., Telephone 234-9350 (Area Code 202)

IDA

December 17, 1962

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Professor Teller:

We are putting out a revised edition of Jason biographies to bring things up to date. Do you have anything to add?

Yours very truly,

David A. Katcher

David A. Katcher

DAK:sjp
Enclosure

sent 11/31/62

INSTITUTE FOR DEFENSE ANALYSES

1666 Connecticut Avenue, N.W., Washington 9, D.C., Telephone 234-9350 (Area Code 202)

IDA

November 28, 1962

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Professor Teller:

I understand from Murph that you have found it possible to address the group only the first thing Friday or Saturday morning. Eight-thirty Saturday morning was seized upon because of complicated prior commitments on Friday (some of which have since washed away). Murph hoped that I could reach you at the Statler today, but I have not been able to do so. I will try to call your office this afternoon, but will mail this letter in case I fail to reach you, and therefore enclose another copy of the program.

Yours very truly,

David A. Katcher

David A. Katcher

DAK:jr
Enclosure

cc: M. Goldberger

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D.C. IDA

January 9, 1962

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Professor Teller:

This final version of Allen Peterson's paper is substantially the same as the draft issued earlier which did not receive wide circulation.

Yours very truly,

David A. Katcher

David A. Katcher

DAK:mas
Enclosure

S-2371 Teller

Destroyed
4/16/63

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D. C.

May 3, 1962

This is the formally published version of the HB-T paper done by Goldberger, Lewis, and Watson at Bowdoin. It does not differ materially from the draft.

David Katcher

David A. Katcher

Enclosure: S-2373

Destroyed
4/16/63

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D. C. IDA

January 24, 1962

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Professor Teller:

This is substantially the same as the draft issued at Bowdoin.

Yours very truly,

David A. Katcher

David A. Katcher

DAK:mas
Enclosure

DA - 5 - 2400

Destroyed 4/16/63

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D.C. IDA

July 6, 1962

MEMO FOR THE JASON GROUP

There have been some editorial changes and some changes of numbers in this final draft. I forward it for your Jason library.

David A. Katcher

David A. Katcher

DAK:mi

Enclosure

IDA log S-2781

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~~SECRET~~ Teller

INSTITUTE FOR DEFENSE ANALYSES

Dr. Charles H. Townes, Vice-President and Director of Research: 1710 H Street, N. W., Washington 6, D. C.

IDA

August 30, 1961

MEMO FOR THE MEMBERS OF JASON

Here are two more contributions to the discussion of the proposal for using an interferometer-type device free of usual phase stability requirements for measuring the size of re-entry bodies.

C. H. T.

Charles H. Townes

CHT:mi
Enclosures: Kroll's Annex
Christofilos' Paper

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IDA Log #S-1863/2

DOCUMENT NUMBER _____

~~SECRET~~

INSTITUTE FOR DEFENSE ANALYSES

1710 H Street, N. W., Washington 6, D. C. IDA

April 19, 1962

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Professor Teller:

This paper precedes by several weeks the document of which it is the Primer.

Yours very truly,

David A. Katcher

David A. Katcher

Enclosure: S-2608

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4/16/63

INSTITUTE FOR DEFENSE ANALYSES
1666 Connecticut Avenue, N.W.
Washington 9, D. C.

October 3, 1962

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Professor Teller:

Herewith is a packet of drafts of papers written at the Jason Summer Study at Berkeley this summer.

More will follow unless you tell me to stop.

Sincerely yours,

David A. Katcher

David A. Katcher

DAK:jr
Enclosure

Unclassified reports detached

Destroyed 4/16/63

IDA

1666 Connecticut Avenue, N.W.
~~1710 H Street, N.W., Washington 6, D.C.~~

October 22, 1962

Professor Edward Teller
Lawrence Radiation Laboratory
University of California
Berkeley 4, California

Dear Dr. Teller:

Batch # 2 of '62
Summer Study Drafts.

David Katcher
David A. Katcher

jr

Edward Teller

INSTITUTE FOR DEFENSE ANALYSES
1666 Connecticut Avenue, N.W.
Washington 9, D. C.

November 5, 1962

Dear Jasons:

A little late . . . .

Yours,

David A. Katcher

David A. Katcher

DAK:jr

Enclosure: IDA/HQ 62-665

INSTITUTE FOR DEFENSE ANALYSES

1666 Connecticut Avenue, N.W., Washington 9, D.C., Telephone 234-9350 (Area Code 202)

IDA

April 2, 1963

JASONS!

Summerperdiem

There has been a rethink on per diem at Woods Hole -- partly because the full impact of rental costs appeared in our gathering real estate information. IDA has asked for and been granted permission by the Government to offer the following this summer:

IDA will pay a minimum of $16 per day for the stay at Woods Hole up to a maximum of $20 per day provided the per diem claimed does not exceed the cost of the rental. Short-termers should be on actual expenses, as always, and, as always, odd cases will be handled oddly.

David

David A. Katcher

DAK:mi

INSTITUTE FOR DEFENSE ANALYSES

Jason Division IDA *1666 Connecticut Avenue, N.W., Washington 9, D.C., Telephone 234-9350 (Area Code 202)*

April 24, 1963

Professor Edward Teller
Department of Physics
University of California
Berkeley 4, California

Dear Ed:

Without attempting to lay out a rigid program and being somewhat vague for obvious reasons, I would like to mention a few topics which at present seem reasonable candidates for summer concentration:

1. Re-entry physics and interaction with Lincoln.
2. Hydromagnetic-accoustic signal propagation.
3. Large weapons.
4. Blackout.
5. HB-T experiment.
6. Laser.
7. Post-attack intelligence -- command and control.
8. How do you determine that the war is over?
9. Evaluation of Russian objectives -- have they given up?
10. General strategic questions.
11. Interaction with Sonar Study at Newport.

It seems likely that Item 6 will be a major activity with support from RESD and some outsiders. There are a number of very tough physics problems to be solved.

We would be proud to have further suggestions.

Sincerely yours,

Marvin

Marvin L. Goldberger

MLG: mi

SECRET

INSTITUTE FOR DEFENSE ANALYSES

1666 Connecticut Avenue, N.W., Washington 9, D.C., Telephone 234-9350 (Area Code 202)

IDA

April 12, 1963

Professor Edward Teller
Department of Physics
University of California
Berkeley 4, California

Dear Professor Teller:

I was surprised to discover that no formal distribution of the Jason/Navy Visiting Group Report had ever been made. Since, for a change, it talks about something other than radar this may be a good time to send it to you.

It is being forwarded through classified mail channels as IDA 62-693.

Yours truly,

Mabel Iverson
for David A Katcher

David A. Katcher

DAK:jr

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INSTITUTE FOR DEFENSE ANALYSES

Jason Division
1666 Connecticut Avenue, N. W.
Washington 9, D. C.
Telephone 234-9350 (Area Code 202)

E R R A T A

IDA Research Paper P-61
Ultraviolet Detection Systems
by
David O. Caldwell

Part inserted + then destroyed w/doc. 9/4/64

There are some significantly confusing typographical transpositions on Page 13 and some changes in values in the Table on Page 14 which should be corrected. Substitute pages are attached herewith.

(signed David A. Katcher)

David A. Katcher

DAK:mi
Enclosures

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Journal of Missile Defense Research

S. S. Penner, EDITOR

PUBLISHED BY IDA FOR THE *Advanced Research Projects Agency* OF THE DEPARTMENT OF DEFENSE

INSTITUTE
FOR DEFENSE
ANALYSES
1666 Connecticut Avenue, N.W.
Washington 9, D.C. *(202) 234-9350*

IDA

August 12, 1963

Dr. E. Teller
University of California
Lawrence Radiation Laboratories
Livermore, California

Dear Dr. Teller:

Enclosed are recent papers dealing with the thermal and blast effects of large nuclear weapons, which may be of interest to you.

The paper by S. Rand entitled "Reradiation from Air Heated by a High Altitude Nuclear Burst" has been accepted for publication in the Journal of Missile Defense Research (JMDR) which is described in the enclosed announcement. Although you indicated some time ago that you did not wish to become an Associate Editor of this publication, I sincerely hope that you and your colleagues will find it desirable to read and contribute to this new journal.

Sincerely yours,

S. S. Penner

S. S. Penner
Editor

SSP:sl
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2. IDA/HQ-63-1804 Copy 1 of 2 SECRET RESTRICTED DATA
3. Announcement JMDR (U)

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ATOMIC ENERGY ACT 1954

LAMS-2532 (Vol. II)

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LOS ALAMOS SCIENTIFIC LABORATORY

OF THE UNIVERSITY OF CALIFORNIA o LOS ALAMOS NEW MEXICO

MANHATTAN DISTRICT HISTORY

PROJECT Y

THE LOS ALAMOS PROJECT

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LAMS-2532 (Vol. II)
SPECIAL DISTRIBUTION

LOS ALAMOS SCIENTIFIC LABORATORY
OF THE UNIVERSITY OF CALIFORNIA LOS ALAMOS NEW MEXICO

REPORT WRITTEN: 1946 and 1947

REPORT DISTRIBUTED: December 1, 1961

MANHATTAN DISTRICT HISTORY
PROJECT Y
THE LOS ALAMOS PROJECT

VOL. II. AUGUST 1945 THROUGH DECEMBER 1946

by

Edith C. Truslow
and
Ralph Carlisle Smith

Contract W-7405-ENG. 36 with the U. S. Atomic Energy Commission

This LAMS report has been prepared because of the demand for and interest in the historical information. The two volumes have not been edited except for classification purposes nor verified for accuracy. All LAMS reports express the views of the authors as of the time they were written and do not necessarily reflect the opinions of the Los Alamos Scientific Laboratory or the final opinion of the authors on the subject.

ABSTRACT

These two volumes constitute a record of the technical, administrative, and policy-making activities of the Los Alamos Project (Project Y) from its inception under the Manhattan District through the development of the atomic bomb (Vol. I), and during the period following the end of World War II until the Manhattan District relinquished control to the Atomic Energy Commission as of January 1947 (Vol. II).

Although security regulations have required some deletions in the original text of the two volumes, every effort has been made to retain the original language and expressions of the authors.

PREFACE

The technical history for Project Y, from its inception until August 1945, has been recorded in LAMS-2532, Vol. I. It is the purpose of this work to present the activities of the Los Alamos Laboratory from August 1945 until the end of December 1946, when the Manhattan District relinquished its control. No attempt has been made to interpret events, or to forecast the importance of scientific developments during this period. This book is merely a chronicle of the reorganization, philosophy, and subsequent achievements which transpired in this critical interim period following the cessation of hostilities.

When a cross reference is made to material within this volume, the paragraph number is in parentheses. When reference is made to Vol. I, this is so indicated.

Historical material for this supplement came from the Director, Dr. N. E. Bradbury; the Administrative Associate Director, Lt. Col. A. W. Betts; the seven Technical Division Leaders: Carson Mark, J. M. B. Kellogg, Marshall Holloway, Eric Jette, Max Roy, R. W. Henderson, and Ralph Carlisle Smith. Further assistance was rendered by J. F. Mullaney, Report Editor, and A. E. Dyhre, Business Manager. The various division Progress Reports were consulted frequently to maintain the chronological order of events, and the central files were extensively used for documentary material.

15 October 1947

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LOS ALAMOS

beginning of an era

1943-1945

ON THE COVER:

Although colored movies were taken of the Trinity test, they were of poor quality and have since deteriorated. This cover photograph, also showing the ravages of time, is the only existing color shot of the test. It was taken, surprisingly enough, by an amateur using his own camera. Jack Aeby, now of H-6, was working at Trinity with Emilio Segre studying delayed gamma rays. Segre secured permission for Aeby to carry his camera to the site to record the group's activities. Came the test and, as Aeby says, "It was there so I shot it." The picture was taken from just outside Base Camp with a Perfex 33 camera using 35 mm film. The photograph provided the basis for the Theoretical Division's earliest calculations of the Trinity weapon's yield and was shortly confiscated by the Army and first published after the announcement was made of the bombing of Japan.

Los Alamos Scientific Laboratory, an equal opportunity employer, is operated by the University of California for the United States Atomic Energy Commission.

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LOS ALAMOS

beginning of an era 1943-1945

This is the story of one of the greatest scientific achievements of all time. It is the story of the founding of the Los Alamos Scientific Laboratory and its successful secret mission to create the first atomic bomb, the weapon that ended World War II.

Information for this story was compiled and edited from previously published articles and brochures on Los Alamos history written by the staff of LASL's Public Relations Office.

ISBN 0-941232-07-7
Reprinted in 1986 under the auspices of the
Los Alamos Historical Society, P.O Box 43, Los Alamos, NM 87544
Second reprint 1989

PART I

starting point

military & scientific realities of 1943

Military considerations had governed the decision, by 1943, that an atomic bomb was desirable, as a means for bringing World War II to an end. Scientific considerations had governed the decision that an atomic bomb was probably feasible. Technological considerations (already being worried about, though they were almost entirely in the realm of the unknown) had made it obvious that the atomic bomb would not be built in a day or a month or a year.

The military picture was grim. The USA was at war with Japan, Germany, and Italy. American naval power had not yet recovered from the disaster at Pearl Harbor. The Japanese had conquered the Philippines, and Japanese naval power was at its height. American soldiers were heavily engaged in North Africa and elsewhere. The Germans had barely begun to suffer the reverses that would turn the tide of war against them. (They surrendered El Alamein late in 1942 and Stalingrad in 1943.) German scientists were working—no American knew how ineffectively—toward an atomic bomb.

The scientific picture was exciting. The phenomenon of uranium fission had been observed several years earlier and had been correctly interpreted before 1940. It was known that at least one kind of uranium nucleus would divide (roughly in half) upon absorption of a neutron, and that this reaction liberated energy plus more neutrons. In December, 1942, a Chicago group under Enrico Fermi had succeeded in bringing about the world's first man-made nuclear chain reaction—a reaction in which the neutrons from fission caused further fission at a sustained level.

The technological picture was very nearly a blank, so far as atomic bombs were concerned. This was true not only because no one had ever tried to build an atomic bomb, but because so much fundamental scientific research remained to be done before anyone ever could.

Enough was known already to suggest the magnitude of the task, both scientifically and technologically. It was known, for instance, that the essential fissionable material—the heart of the bomb—would be hard to prepare.

Fermi's historic "pile" consisted of graphite